

## **Attachment E**

### **SECTION 401 CERTIFICATION SYNTHETIC PRECIPITATION LEACHING PROCEDURE WORK PLAN**

This Work Plan provides an alternative methodology for meeting the fill suitability criteria found in Section E.1(b) of the Department of Ecology's Water Quality Certification #1996-4-02325 (the "Certification") issued to the Port of Seattle ("Port"). This Work Plan describes procedures for use of the Synthetic Precipitation Leaching Procedure ("SPLP") to determine the suitability of fill for the Port's third runway embankment and other Port projects for which the fill criteria of the Certification are applicable (defined in the Certification as "Port 404 Projects").

#### **I. Summary of Requirements**

Requirements applicable to the Port include those of the Certification and also those contained in the U.S. Fish and Wildlife Service's ("FWS") May 22, 2001 biological opinion ("BO") (FWS Reference Number 1-3-00-F-1420). The Ecology Certification and the FWS BO both have screening level criteria for Port 404 Projects, including the third runway embankment (the "Embankment"), as well as special screening criteria that apply to a zone of material above the drainage layer at the bottom of the embankment. Special criteria for this zone (referred to as the "drainage layer cover" in the BO and in this document) are applicable to a zone that is 40 ft thick at the face of the embankment and reduces in height to the east at a rate of 2 percent until it meets the drainage layer at the existing ground surface to the east.

Table 1 shows the soil criteria that have been developed for the third runway embankment by FWS and Port 404 Projects by Ecology. Ecology's Certification specifies soil criteria for 14 metals and TPH (column 5 – the last column on the right). In addition, the Certification soil criteria for chromium, lead, nickel, and diesel in the drainage layer cover of the Embankment are more stringent than for the rest of the Embankment and other Port 404 Projects (column 2). The FWS BO specifies soil criteria for the drainage layer cover as shown in column 3 for the RCRA 8 metals. Because the FWS and Ecology soil criteria differ, the Port will use the most stringent criteria of the two for the drainage layer cover (shown in column 4) and for the remainder of the Embankment (shown in column 5).

Because metals are naturally occurring, they have widespread concentration variability throughout the Pacific Northwest. Many of the soil criteria in Table 1 are at Puget Sound background concentrations calculated at the 90<sup>th</sup> percentile. Thus, by definition a constituent, even at a naturally-occurring, unaltered concentration will fail these criteria 10% of the time. When testing is done for multiple constituents, the probability that naturally-occurring concentrations will disqualify a fill source rises. For fill constituents that do not meet the screening criteria of the Certification and BO, fill acceptability can be demonstrated using the SPLP test procedure.

In accordance with the BO, upper bounds are established for constituent concentrations that cannot be accepted even following a successful SPLP test (referred to in this document as “upper bound limits”). For the drainage layer cover, the upper bound limits are set in the BO at applicable MTCA Method A standards. However, Method A values were not available for barium, selenium and silver. As a result, the upper bound limit for barium was backcalculated using the MTCA three phase partitioning approach (WAC 173-340-747) and selenium and silver soil criteria were set at the PQL. Upper bound limits for the drainage layer cover and the remainder of the Embankment are incorporated into this Work Plan to avoid any potential inconsistency with the BO. As such, any material that is unacceptable for the Embankment under the BO is also unacceptable for the Embankment under this Work Plan and the Certification.

At proposed fill sources for which sampling is required in accordance with the Certification, the appropriate number of samples of proposed fill material (per Certification requirements) will be collected and analyzed for the constituents listed in Condition E.1(b). Constituent concentrations will be compared to the lower screening criteria in Condition E.1(b) and in the BO for the drainage layer cover (Table, 1, column 4) or for the rest of the embankment (Table 1, column 5). If the screening criteria are not exceeded, fill from that source will be considered suitable for placement in the appropriate portion of the embankment, or on other Port 404 Projects. If the screening criteria are exceeded, but the upper bound limits are not exceeded, the Port must demonstrate fill suitability by employing the SPLP testing protocol discussed below prior to accepting fill from that source.

## **II. SPLP Testing Protocol**

The purpose of the SPLP is to evaluate the potential for metals and organic constituents to mobilize and move through soils in fluid form. The SPLP is an accepted laboratory leaching test, as discussed in WAC 173-340-747(7). The SPLP will be conducted in

accordance with the procedures contained in SW-846 Method 1312. In the SPLP, fluid representing acid rain is passed through a soil sample and the liquid is collected and analyzed.

SPLP testing will be conducted and the results will be evaluated relative to the applicable ambient water quality criteria of WAC 173-201A as discussed below. In the event that SPLP results consistently show that criteria for specific metals are not exceeded across a range of sites and soil conditions, the Port may elect to submit such information to Ecology for its review as evidence that the Port may discontinue the requirement to implement SPLP for specific metals. Upon approval by Ecology, the Port may then adopt the applicable upper bound limit, or some intermediate figure as determined by Ecology, as its new soil screening criterion for that constituent.

Use of SPLP to demonstrate fill acceptability will require sampling of the material proposed as imported fill. At a minimum, one SPLP sample will be collected for each original sample that exceeds the screening criteria. This sample will be representative of the area where the original sample indicating an exceedence of the screening criteria was collected. The SPLP will only be conducted for the specific chemical constituent that exceeds the criteria.

### **III. Screening Procedure**

Results from the SPLP will be compared to freshwater ambient water quality criteria according to guidelines outlined in WAC 173-201A-040 (adjusted for PQLs). As an initial screening tool, the constituent concentrations as determined from the SPLP will be divided by a dilution factor of 20. The default dilution factor of 20 was established by Ecology for use in the Three Phase Partitioning Model (WAC 173-747). This dilution factor represents a very conservative estimate because it accounts only for the dilution that occurs between the pore water at the spot in the embankment where the constituent exceeded water quality criteria, and ground water in the saturated zone directly below, without accounting for attenuation processes. The actual dilution factor, first from a specific point in the embankment through the underlying drainage layer and then transport to Miller Creek, is much greater. If the adjusted SPLP results are equal to or below the freshwater ambient water quality criteria, the material will be considered suitable for placement in the embankment (including the drainage layer cover, provided applicable upper bound limits were not exceeded for any constituents in the initial soil test prior to SPLP use). If adjusted SPLP results are above freshwater ambient water quality criteria, the material will be rejected and will not be considered suitable for placement at any location within the embankment.

**Water Quality Certification # 1996-4-02325 (Amended-1)**

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Water Quality Certification # 1996-4-02325 (Amended-1)  
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Attachment E/SPLP Workplan Table 1

**Table 1**

Criteria for Drainage layer cover and other Port 404 Projects.

Constituent	Ecology special criteria for drainage layer cover (mg/kg)	FWS drainage layer cover criteria (mg/kg)	Final drainage layer cover criteria (most conservative of FWS and Ecology values) (mg/kg)	Ecology criteria for remainder of embankment and other Port 404 Projects (mg/kg)
Antimony		NA	16	16
Arsenic		7	7	20
Barium		12,000	12,000	NA
Beryllium		NA	0.6	0.6
Cadmium		1	1	2
Chromium	42	48	42	2000
Copper		NA	36	36
Lead	220	24	24	250
Mercury		0.07	0.07	2
Nickel	100	NA	48	110
Selenium		5	5	5
Silver		5	5	5
Thallium		NA	2	2
Zinc		NA	85	85
Gasoline		NA	30	30
Diesel	460	NA	460	2000
Heavy Oils		NA	2000	2000